MEMORANDUM

DATE: **May 27, 2014**

TO: **Nick Hetrick, Arcata FWO**

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SUBJECT: **Preliminary 2014 *Ceratomyxa shasta* Prevalence Data for Klamath River Juvenile Chinook Salmon**

As a component of Klamath River fish health assessment, the California-Nevada Fish Health Center is examining juvenile Klamath River Chinook salmon to monitor the prevalence of *Ceratomyxa shasta* and *Parvicapsula minibicornis* infection. In order to provide this data as rapidly as possible, the Center has accelerated QPCR testing of natural fish collected from the Shasta to Scott (K4) and Scott to Salmon (K3) reaches. This data is preliminary, and may be subject to change prior to regular monitoring updates normally provided at the end of June, July and August each year. This preliminary *C. shasta* data will be provided to the Klamath Fish Health Assessment Team (KFHAT) via a conference call scheduled for today, 27 May.

To date, QPCR testing has been performed for natural fish collected from 6 April through 4 May for the Shasta to Scott (K4) reach and 13 April to 4 May for the Scott to Salmon (K3) reach. An additional twenty fish were collected 30 March in the K4 reach, but have not been processed. Note that 2013 data for both reaches have been included in the graphs to provide a relative comparison of infection onset and prevalence from the previous monitoring year. An additional sample week of 12 May was included for 2013. Similar data for the corresponding sample week beginning 11 May in 2014 is not available at this time, pending laboratory testing.

Ceratomyxa shasta has been detected in 82.8% (144/174) of natural fish tested to date. Mean DNA copy number is included in Table 1. Early April sampling in these reaches indicates parasite load in juvenile fish was low despite high numbers of fish being infected. Increased parasite DNA copy numbers in weeks 5 and 6 (27 Apr to 4 May) in the Shasta to Scott (K4) reach are indicative of sub-clinical infection levels in juvenile Chinook salmon. While few clinical disease signs were observed overall during fish necropsy, three fish collected 4 May from the K4 reach had DNA levels ranging from 115,000-360,000 copies. These levels indicate clinical ceratomyxosis in individual juvenile Chinook salmon collected in early May.

Table 1. *Ceratomyxa shasta* prevalence of infection (POI) and mean DNA copy number by Quantitative Polymerase Chain Reaction (QPCR).

Reach	*Sample Week*	*Date*	Total Number Samples	Number *C. shasta* Positive	*C. shasta* POI	Mean DNA Copy Number
Shasta to Scott (K4)	1	30 Mar	*(20)*	*Pending*	*Pending*	*Pending*
	2	6 Apr	20	8	40%	5
	3	13 Apr	20	13	65%	23
	4	20 Apr	20	18	90%	162
	5	27 Apr	20	18	90%	47,496
	6	4 May	18	18	100%	46,616
Scott to Salmon (K3)	1	30 Mar	--	NS	NS[1]	--
	2	6 Apr	--	NS	NS	--
	3	13 Apr	20	16	80%	28
	4	20 Apr	20	17	85%	93
	5	27 Apr	20	20	100%	598
	6	4 May	16[2]	16	100%	4908

[1] NS – Not Sampled.
[2] May 4 data for K3 is incomplete (partial sample set of 16 of 20 fish has been tested to date).

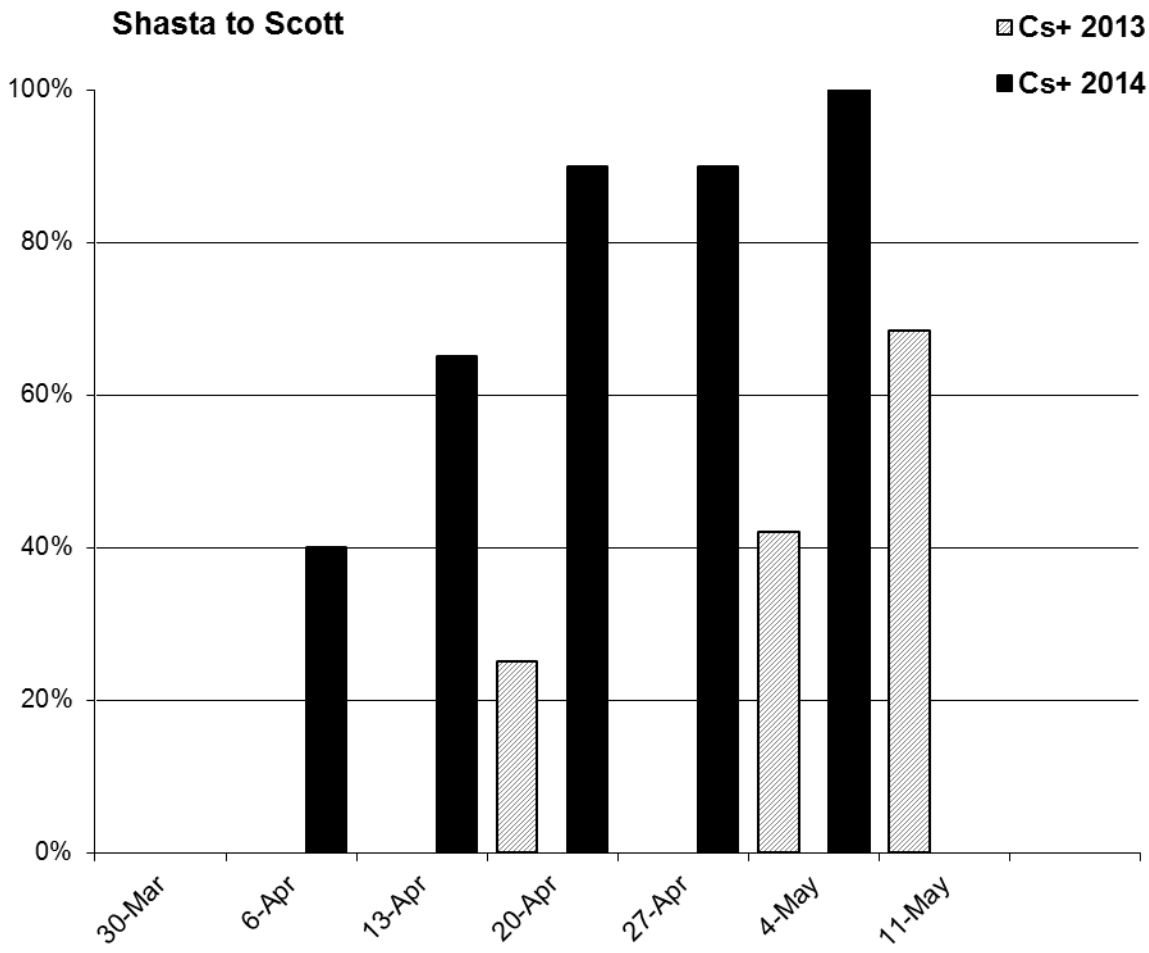

Figure 1. Weekly prevalence of *Ceratomyxa shasta* infection in juvenile Chinook salmon captured in the Shasta to Scott (K4) reach on the Klamath River from 6 Apr to 4 May. Twenty fish collected 30 March are pending processing. Data for 11 May is only shown for 2013; data for the corresponding sample week in 2014 is pending laboratory testing.

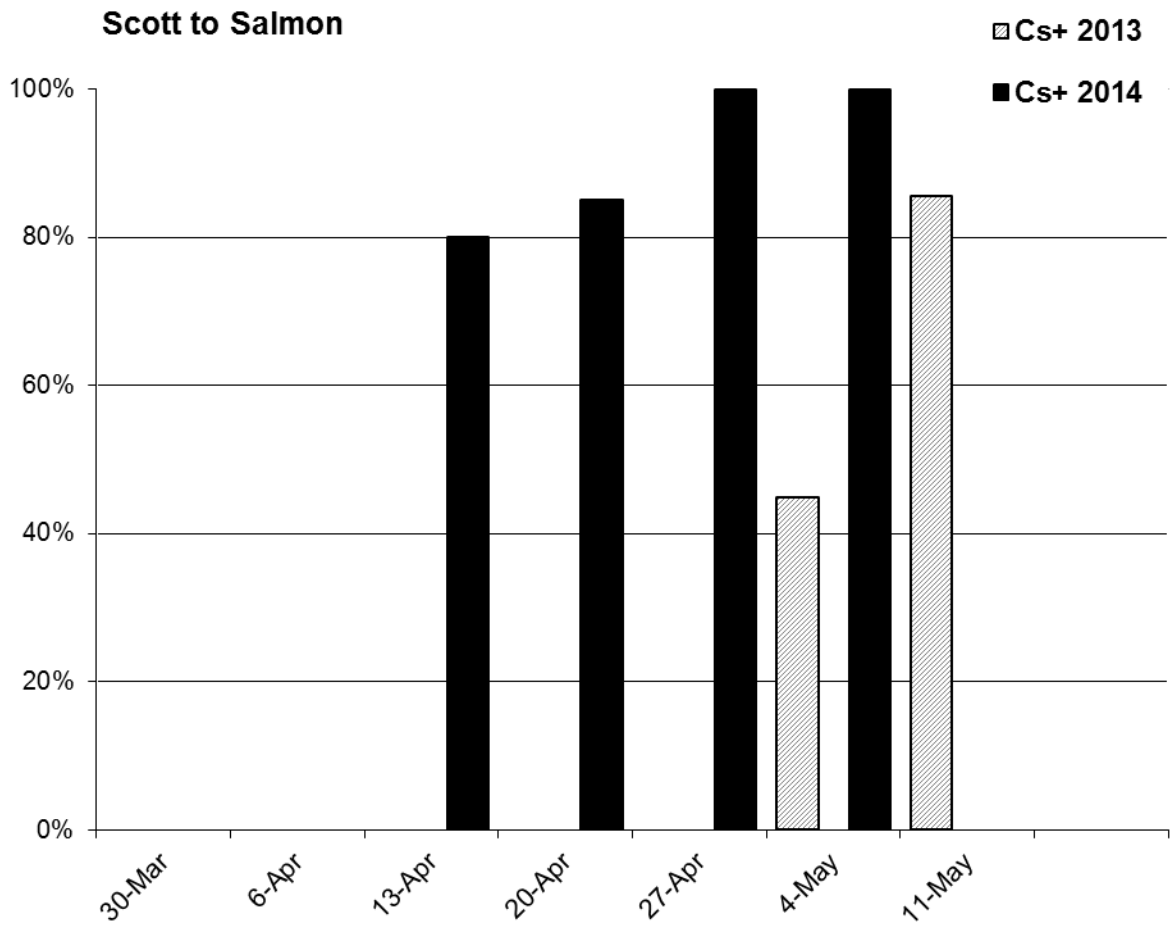

Figure 2. Weekly prevalence of *Ceratomyxa shasta* infection in juvenile Chinook salmon captured in the Scott to Salmon (K3) reach on the Klamath River from 13 Apr to 4 May. Fish were not sampled 30 Mar or 6 Apr in 2014. In 2013, twenty fish collected 30 Mar and on 6 Apr were negative for *C. shasta*. Data for 11 May is only shown for 2013; data for the corresponding sample week in 2014 is pending laboratory testing.